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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/356,119 07/16/99 RODOMISTA

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EXAMINER

IP.S

ART UNIT

PAPER NUMBER

2837

DATE MAILED:

07/12/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/356,119

Applicant(s)

RODOMISTA ET AL.

Examiner

Paul Ip

Art Unit

2837

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 15 June 2001.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 24-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 24-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121. *Paul Ip*

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 10 & 11. 6) ☐ Other: _____

Art Unit: 2837

DETAILED ACTION

Specification

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The following is a quotation of 37 CFR 1.71(a)-(c):

(a) The specification must include a written description of the invention or discovery and of the manner and process of making and using the same, and is required to be in such full, clear, concise, and exact terms as to enable any person skilled in the art or science to which the invention or discovery appertains, or with which it is most nearly connected, to make and use the same.

(b) The specification must set forth the precise invention for which a patent is solicited, in such manner as to distinguish it from other inventions and from what is old. It must describe completely a specific embodiment of the process, machine, manufacture, composition of matter or improvement invented, and must explain the mode of operation or principle whenever applicable. The best mode contemplated by the inventor of carrying out his invention must be set forth.

(c) In the case of an improvement, the specification must particularly point out the part or parts of the process, machine, manufacture, or composition of matter to which the improvement relates, and the description should be confined to the specific improvement and to such parts as necessarily cooperate with it or as may be necessary to a complete understanding or description of it.

The specification is objected to under 37 CFR 1.71 because figure 1 only shows a robot with the arms movement in angular positions in a three dimensional space called a "work volume" in the specification. Figures 2A-2E show angular measurement cable drive devices called "haptic interface" 10. The specification fails to disclose any "work volume" measurement or center point measurement other than the cable drive features as shown in figures 2A-2E of the invention. Page 14 of the specification discloses the haptic interface and an encoder 84 for tracking angular position with a defined "home" position and "flags 94a-c forming gaps 95a-c. The specification fails to disclose any method of haptic interface other than only discloses that "The haptic interface 10 may include automatic work volume calibration components for use in combination with computer software such that the haptic system, as a whole, has capability to initialize position of the haptic interface 10 when the system is energized and geometrically center the user reference points in both the workspace volume and virtual or remote environment". The specification fails to clear define the "haptic

Art Unit: 2837

interface" and "work volume" calibration other than the angular measurement as shown in figures 2A-2E and figure 7.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 24-31 are rejected for the reason as set forth in the previous paragraph.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

2. Claims 24-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zilles et al. '577 in view of Buote '846.

The patent to Zilles et al. discloses a method and apparatus for determining forces to be applied to a user through a haptic interface. Zilles et al. show in figures 1, 2, 7, 8, 11, 12, and 13 the positioning steps in terms of flow diagrams. Zilles et al. further show in figures 4-6 different techniques of defining a fiducial object point. Zilles et al. show in figures 6A and 6B that the fiducial object points which are considered as a tool center points to one of ordinary skill in the art. Whereas, the claims also require at

Art Unit: 2837

least one rotary element, at least one flag disposed on the at least one rotary element, a user interface connection, and means for determining angular orientation of the at least one flag to geometrically calibrate the work volume. Considering these limitations in view of figures 2B-2E, and figure 5 of the invention, one of ordinary skill in the art would appreciate the angular position measurement apparatus as taught or suggested by Buote. Buote shows in figures 1 and 2 angular orientation calibration devices with a number of slots or indices on a position disc for a robot 11. One of ordinary skill in the art would consider that the operation of the robot is the work volume. Since Zilles et al. measure the work volume in terms of angular positions, in light of Buote, it would have been obvious to one of ordinary skill in the art to provide Zilles et al. with the angular position measurement apparatus as taught or suggested by Buote.

Response to Amendment

3. Applicants' arguments filed on June 15, 2001 have been fully considered but they are not persuasive.

Applicants defined the terms "work volume" and "workspace volume" by the definition of McGraw-Hill Dictionary of Scientific and Technical Terms, Fifth Edition ©1994. However, applicant miss interpreted the term "work volume" as "work space volume". The only recitation of "work volume" without the recitation of "work space volume" defeats the definition of the term "space volume" for robotic control. In this case, the specification only recite "work volume" is inaccurate. Therefore, the specification is rejected under 35 U.S.C. 112, first paragraph for failing to particularly define the invention.

The Examiner agreed with applicants that Haptic interfaces are notoriously well known in the art. It is not clear whether applicant claims "haptic interfaces" in the claims as part of the invention or not part of the invention. Furthermore, figures 2A-2E show the cable drive systems for measuring angular position of the robot shown in figure 1 for "haptic interfaces" and measuring the "work volume" (work space volume). It is not clear as how the cable drive system is related to the well known haptic interfaces.

Art Unit: 2837

Applicants stated that:

The rotary element is only a single part of the haptic interface and not the haptic interface itself. With respect to independent claims 25 and 30, the rotary element as claimed is an element utilized for calibrating the work volume of a haptic interface.

Applicants' statement is inaccurate. The rotary element as claimed is an element utilized for calibrating the angular position of a haptic interface instead of calibrating the work space volume.

Applicants argue that:

Applicants respectfully submit that the claim, read in view of the specification and the prior art, does not require the recitation of the additional steps listed in the Office Action. Specifically, the recited steps are not necessary or essential to enable one skilled in the art to practice the claimed method. Claim 24 as presently written is one of a number of methods disclosed in the present application to which the Applicants are entitled, because no prior art has been cited that discloses all of the steps of the claimed method, i.e., "initializing a position of the haptic interface" and "geometrically centering a user reference point."

Applicants' argument is not persuasive. The claimed steps as recited in claim 24 is considered method steps of the invention which is essential to enable one skilled in the art to practice or otherwise the method steps are incomplete. Claim 24 is not written in "means plus function" as required by 35 USC 112, sixth paragraph format. Therefore, the claim is interpreted by itself instead of read in view of the specification, but definitely not the prior art. According to 35 USC 112, -second paragraph, additional steps are required. Furthermore, the steps of "initializing a position of the haptic interface" and "geometrically centering a user reference point" are notorious old in robot control for tip center point calibration. The method steps are not new in the art.

Applicants' further argue that:

The methods and system of the present invention eliminate the need to perform those types of operations. Generally, the present invention calibrates the work volume of the haptic interface by initializing a position of the haptic interface and tracking the angular orientation of a rotary element.

Art Unit: 2837

The Examiner agreed with applicants' argument. However, applicants should be aware that the argument is not supported by the claims of the invention. None of the claims recite such feature in the claims. Figures 2A-2E show the angular calibration drive of the invention. Whereas, the claims recite as "work volume" and "a position of the haptic interface". These recitation cause misleading and different from "work space volume" and "angular position of the haptic interface" as applicants now defined in the argument.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul Ip whose telephone number is (703)-308-3098. The examiner can normally be reached on 6:30 a.m. to 3:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Nappi can be reached on (703)-308-3370. The fax phone numbers for the organization where this application or proceeding is assigned are (703)-308-3431 for regular communications and (703)-308-3431 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)-308-0956.



Paul Ip
Primary Examiner
Art Unit 2837

July 10, 2001